



ADVANCED CIRCUITRY

P. O. Box 2847, Commercial Station, Springfield, Mo. 65803 417 862-0751

Karen

August 4, 1982

Mr. John J. Franke  
Regional Administrator  
U.S. Environmental Protection Agency  
Region VII  
324 E. 11th  
Kansas City, Missouri 64106

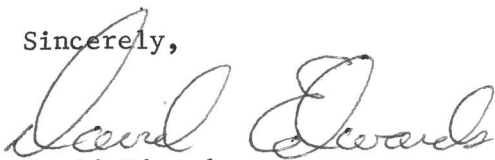
ARTHM/ENMIG  
AUG 03 1982  
Region VII A.C., MO

Dear Mr. Franke:

Please find enclosed our revised closure plan which contains the additional information which Mr. David Bedan of the Missouri DNR and Ms. Karen Flournoy of the EPA have requested.

If additional information is required, please notify me at your convenience.

Sincerely,



David Edwards  
Facilities Manager

DE/bs

Enclosure

CC: Mr. Gerald Lucey, ACD  
Mr. Ron Enos, ACD  
Ms. Karen Flournoy, EPA



R00337330  
RCRA RECORDS CENTER

Subpart G - Closure and Post-Closure

265.111 Closure and Post-Closure

A. Owner shall close facility in a manner to minimize all hazards.

265.112 Closure Plan

- A. In March, 1982, the city sewer system was available for hookup and Litton began its use for effluent discharge. At that time, Litton discontinued discharging effluent waters to "A" pond. Due to the DNR Eminent Hazardous Action of March, 1982, the waste water in "A" pond was removed. Closure is expected to begin between August 1st and 15th, 1982.
- B. Enclosed are analysis by independent testing labs of our sludge. The samples were approximately one liter in size and taken as representative grab samples. The samples were taken at the North East and South West corners of our lagoon. All samples were collected in inert, clean containers. Also included, are our analysis of sludge samples taken by Mr. Paul Meiburger of the DNR on July 29, 1982. The analysis was performed by our lab for comparison with the state laboratory.
- C. Based on calculations enclosed, approximately 1800 yd<sup>3</sup> of sludge will have accumulated. Our contractor, National Industrial Environmental Service (NIES) will remove, transport, and dispose of the sludge in a safe and timely manner. The disposal site will be Joliet, Illinois. Appropriate Illinois permits are currently being reviewed by the state of Illinois.
- D. Advanced Circuitry proposes to remove the limestone and/or soil beneath the sludge to a depth where the levels of chrome, nickel, and total lead meet the levels specified below. The maximum allowable metal levels, in the residual soil, are:

Lead (TEP)	1.5 ppm
Total Lead (Digestion)	1.5 ppm
Chromium (TEP)	1.5 ppm
Nickel (TEP)	4.0 ppm

or, sampling at a depth of 12" below the surface to insure that significant decreases (an order of magnitude) with depth are not occurring, so long as the uppermost residual soil metal content does not exceed:

Lead (TEP)	2.5 ppm
Total Lead (Digestion)	2.5 ppm
Chromium (TEP)	2.5 ppm
Nickel (TEP)	10 ppm

After the sludge is removed, surface samples will be taken at locations shown in the attached sketch. All samples will be at least one liter in volume and will include the top 3 inches of soil. This sample will then be divided into 2 samples and marked identically. The first sample will be given to the DNR representative on hand during our closure. The second sample will be tested in our laboratory for the above metals. Advanced Circuitry will test for chromium, lead, and nickel per EP Toxicity Test Procedure revised by 46FR35247, July 7, 1981, and test for total lead per EPA Manual Section 4.1.3, EPA #600/4-79-020 "Method For Chemical Analysis For Water And Waste". The Atomic Absorption unit at Advanced Circuitry is capable of measuring concentrations down to .01 ppm of lead, .002 ppm of chromium, and .01 ppm of nickel.

It is expected that our laboratory will run quality assurance samples, provided by the DNR, on a daily basis.

The flow diagram for sampling process is as follows:

- ① Surface sample taken and analyzed:
  - a) If all metal level values are below table 1, then the general area of sample is suitable for closure.
  - b) If any metal level value is above table 1, but below table 2, then go to ②.
  - c) If any metal level value is above table 2, then go to ③.
- ② Take soil sample 12" beneath surface and analyze for metal that failed in ①:
  - a) If metal level is greater than .1 times the surface value, then the general area is suitable for closure.
  - b) If metal level is less than .1 times the surface value, then the additional amount of soil and/or limestone to be removed from the surface will be determined by the formula:

$$\frac{\text{Surface Metal Level}}{\text{Table 1 Metal Level}} = \frac{\text{Depth to be Removed}}{12''}$$

- ③ Take soil sample 12" beneath surface and analyze for metal that failed in ①.
  - a) If metal level is greater than .1 times the surface value, then the general area is suitable for closure.
  - b) If the metal level is less than .1 times the surface value, then the additional amount of soil and/or limestone to be removed will be determined by the formula:

$$\frac{\text{Surface Metal Level}}{\text{Table 2 Metal Level}} = \frac{\text{Depth to be Removed}}{12''}$$

Table 1

Total Chromium or Chrome VI (TEP)	1.5 mg/l
Nickel (TEP)	4.0 mg/l
Total Lead (Digestion)	1.5 mg/l
Lead (TEP)	1.5 mg/l

Table 2

Total Chromium or Chrome VI (TEP)	2.5 mg/l
Nickel (TEP)	10.0 mg/l
Total Lead (Digestion)	2.5 mg/l
Lead (TEP)	2.5 mg/l

Before any area can be "closed", the registered professional engineer must sign the analysis to show his concurrence with the results. Once the engineer concurs, the area will be backfilled with approximately 2" of dirt. The final dirt depth will be determined after all areas have been found suitable for closure. At that time, a topographic survey will be conducted on site to assure good drainage.

- E. Any accumulation of sludge will be stored within the confines of "A" pond. The only need of accumulation is due to scheduling delays between shipments of our sludge. No sludge will be stored for longer than 90 days.
- F. Prior to closure starting, the Springfield office of the Missouri Department of Natural Resources will be given five days notice. Actual closure will start between August 1st and August 15, 1982, and will take approximately 8 days. Final closure will consist of grading over and seeding of the site.
- G. During closure operations, the DNR representative must be on site at all times due to our expected operating procedure. We plan to remove the sludge, sample, and cover the cleared area as we work our way across the pond.
- H. In the unlikely event a sinkhole develops within the confines of "A" pond, the following procedure is recommended:
  - 1) Remove as much sludge and soil from the sinkhole as possible.
  - 2) Fill the sinkhole with large, coarse rocks and mound with smaller rocks to aid drainage.

The above were recommended by State Geologist J. VanDyke and T. Dean on March 18, 1982.

265.113 Time Allowed for Closure

- A. Closure is to take place within 180 days of last receipt of wastes.
- B. We may apply to Regional Administrator for longer closure time.

265.114 Disposal or Decontamination of Equipment

- A. All the equipment and structures used in the closure shall be properly disposed of, or decontaminated by high pressure water spray applied within the confines of "A" pond. This is to be done by NIES.

265.115 Certification of Closure

- A. Upon closure, Litton shall submit to the Regional Director certification thereof, signed by the operator and an independent professional registered engineer. The engineering firm of Hood-Rich has been contracted to oversee our operation. The engineer of Hood-Rich, Mr. Paul Hickman, feels that a daily inspection of between one and two hours should adequately enable him to properly evaluate our closure operation.
- B. Litton will make every effort to comply with the September 15, 1982, closure and certification date.

265.142 Closure Cost

- A. Based on current estimates, the cost to close our waste water lagoon is approximately \$180,000.





H R ARCHITECTS AND CONSULTING ENGINEERS

801 SOUTH GLENSTONE  
SPRINGFIELD, MO. 65802  
417 862-4483

July 22, 1982

Mr. David Edwards  
Facilities Manager  
Advanced Circuitry Div.  
Litton Industries  
P. O. Box 2847, CS  
Springfield, MO. 65803

Re: Engineering Services for "A" Pond Closure

Dear Mr. Edwards:

I have received your revised plan for closure of "A" pond and reviewed the various aspects of it and everything appears to be adequately covered.

I feel that the estimate of 1 to 2 hours per day, during operations, will be satisfactory, however, an initial inspection immediately prior to startup and a final detailed inspection after completion is necessary. One other item you might want to consider is that once the final cover is placed and compacted, a topographic survey be done on the site and immediate area to assure good drainage and prevent any "ponding". I would also expect to prepare a daily written report to be included in my final report.

Some of the tasks I would envision performing are as follows:

1. Daily inspection during operations with pictures and sketches, if necessary.
2. Daily written report.
3. Observe one or more actual sampling and testing operation(s) of the soil samples.
4. Observe loading and sealing of one or more dumptrailer(s).
5. Review of all soil test results
6. Observe decontamination procedure.

JACK K. HOOD, Architect  
DONALD L. RICH, P.E.

ARCHITECTURAL  
ENGINEERING  
LAND SURVEYING  
INTERIOR DESIGN

Page 2

Mr. David Edwards

7. Daily contact with DNR and Litton representatives.

8. Preparation of final report and delivery to ACD

These are the things that immediately come to mind however, if you have any other suggestions, please feel free to let me know.

Due to some of the uncertainties, we would propose to perform the work on an hourly payment basis with other reimbursable expenses. My time would be at the rate of \$60.00 per hour including travel time. I have estimated that if everything goes on schedule, the total charges for our services would be \$2,500.00 or less. If this is agreeable please let Dan Leary of your Purchasing Dept. know as he called me for the amount before I reviewed the final plan. Also, please try to let me know several days ahead of startup, if possible.

If anything further is needed, please let me know.

Yours truly,

HOOD - RICH



Paul T. Hickman

PTH:cl

JACK K. HOOD, Architect  
DONALD L. RICH, P.E.

ARCHITECTURAL  
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LAND SURVEYING  
INTERIOR DESIGN

# QUALITY CONTROL LABORATORY ANALYSIS TEST REQUEST

1 OF

Originator <u>Dave Edwards</u>	Dept. <u>Fac.</u>	Ext.	Date <u>8-3-82</u>
Date Req'd	Time Req'd	Approval	Shift <u>1</u>

## SAMPLE DESCRIPTION:

Core samples

24 hr analysis of  
core samples.

## ANALYSIS/TEST REQUIRED (EXPLANATION FULLY):

Cu, Cr, Pb, Ni, PPM

## DATA/RESULTS:

SAMPLE #	Cu PPM	Pb PPM	Ni PPM	Cr PPM		
Inlet <sup>TOP</sup> Middle	0.5	0.4	0.7	0.0		
Inlet <sup>BOTTOM</sup> Middle	0.1	0.4	0.6	0.0		
Inlet Middle	3.1	0.4	0.5	0.0		
Inlet Middle	0.9	0.4	0.5	0.0		
A Center	0.9	0.4	0.5	0.0		
B Center	0.7	0.4	0.5	0.0		

## CALCULATIONS:

#82-6139 Total Lead = .001% by weight

Lab TECH B. Holm DATE & TIME COMP. 8-3-82 9:15

Distribution: Originator, Lab file. Originator is responsible for any additional distribution.



# QUALITY CONTROL LABORATORY ANALYSIS TEST REQUEST

1 OF \_\_\_\_\_

Originator <u>Dave Edwards</u>	Dept. <u>Fac.</u>	Ext. <u>329</u>	Date
Date	Req'd	Time Req'd	Approval
			Shift

## SAMPLE DESCRIPTION:

Core samples

## ANALYSIS/TEST REQUIRED (EXPLANATION FULLY):

Cu, Pb, Ni, Cr PPM

## DATA/RESULTS:

SAMPLE #	Cu PPM	Pb PPM	Ni PPM	Cr PPM		
<u>52-6142</u>	<u>0.4</u>	<u>0.4</u>	<u>3.3</u>	<u>0.1</u>		

## CALCULATIONS:

Lab TECH B. Halpern DATE & TIME COMP. 8-1-82 1230

Distribution: Originator, Lab file. Originator is responsible for any additional distribution.



## QUALITY CONTROL LABORATORY ANALYSIS TEST REQUEST

1 OF \_\_\_\_\_

Originator <u>DAVE EDWARDS</u>	Dept. <u>FAC</u>	Ext. <u>329</u>	Date _____
Date _____	Time Req'd _____	Approval _____	Shift _____

## SAMPLE DESCRIPTION:

3 CORE SAMPLES

## ANALYSIS/TEST REQUIRED (EXPLANATION FULLY):

Cu, Pb, Ni, Cr ppm

## DATA/RESULTS:

SAMPLE #	Cu ppm	Pb ppm	Ni ppm	Cr ppm		
82-6138	2.1	0.4	3.2	0.1		
82-6140	9.1	0.5	7.5	0.1		
82-6141	100.0	0.2	19.0	0.2		

## CALCULATIONS:

Lab TECH B. Holm DATE & TIME COMP. 8-1-82 1100

Distribution: Originator, Lab file. Originator is responsible for any additional distribution.



## QUALITY CONTROL LABORATORY ANALYSIS TEST REQUEST

1 OF 2

Originator <u>Dave Edwards</u>	Dept. <u>Fac.</u>	Ext. <u>329</u>	Date
Date	Req'd	Time Req'd	Approval
			Shift

## SAMPLE DESCRIPTION:

1- Core Samples

## ANALYSIS/TEST REQUIRED (EXPLANATION FULLY):

Cu, Pb, Ni, Cr ppm

## DATA/RESULTS:

SAMPLE #	Cu ppm	Pb ppm	Ni ppm	Cr ppm		
82-6135	140.0	0.7	9.3	0.8		
82-6136	260.0	0.4	16.0	0.4		
82-6137	1.2	0.5	3.9	0.1		
82-6139	0.5	0.1	0.2	0.0		

## CALCULATIONS:

Lab TECH B. Holmes DATE & TIME COMP. 8-1-82 11:00

Distribution: Originator, Lab file. Originator is responsible for any additional distribution.



## Chemical Waste Management, Inc.

Environmental Remedial Action Division  
150 W. 137th Street  
Riverdale, Illinois 60627  
312/841-8600

July 15, 1982

Litton Industries  
Advanced Circuitry Division  
4811 West Kearney  
Springfield, Missouri 65803

Dear Mr. Copeland:

Chemical Waste Management's ENRAC Division appreciates the opportunity to submit a proposal to remove and dispose of sludge in a lagoon at your Advanced Circuitry Division in Springfield, Missouri.

ENRAC has undertaken and successfully completed many lagoon cleanings in a safe and cost efficient manner. We are confident that we can provide you with service that is unmatched in the industry.

The transportation and disposal figure to Joliet, Illinois is calculated by using a minimum of 22 yd<sup>3</sup> per truck load. The figure is also contingent upon receipt of a state disposal permit.

Application for said permit was made 2 July 82. We should receive approval of this application by the end of July. As you will note in our quotation, I estimate the time required to complete work on your lagoon at 8 working days. This means we can begin work as late as 1 September and complete the closure of the lagoon by your 15 September deadline.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Scott Schedell", is written over the typed name.

Scott Schedell  
Project Coordinator

SS/db



### TECHNICAL PROPOSAL

The scope of work for this project can be grouped into 3 phases.

1. Cleaning of the lagoon and stockpiling, for loading, of the lagoon sludge
2. Loading of the stockpiled sludge in sealed dumptrailers for transportation to a secure landfill
3. Backfilling and grading of the cleaned lagoon

We propose to use one machine, a track type loader, to complete the 3 phases. This will keep excavating and mobilization costs to a minimum.

When operations begin a hole will be excavated in the surrounding containment berm to facilitate the loading of the sludge material. The loader will then enter the lagoon area and begin stockpiling the sludge near the hole in the containment berm. A representative from your company will have to make a determination as to when the extent of excavation is adequate.

Backfilling operations will begin immediately in clean areas. This will be done by dozing the containment berm into the clean area. The entire lagoon area will then be graded for drainage and appearance.

This proposal is based on the assumption that the sludge material can be loaded as is. No provision is made for solidification agents or solidifying procedures.

We propose to remove 300 yd<sup>3</sup> of sludge material per day. This will enable us to complete the project in approximately 8 working days.

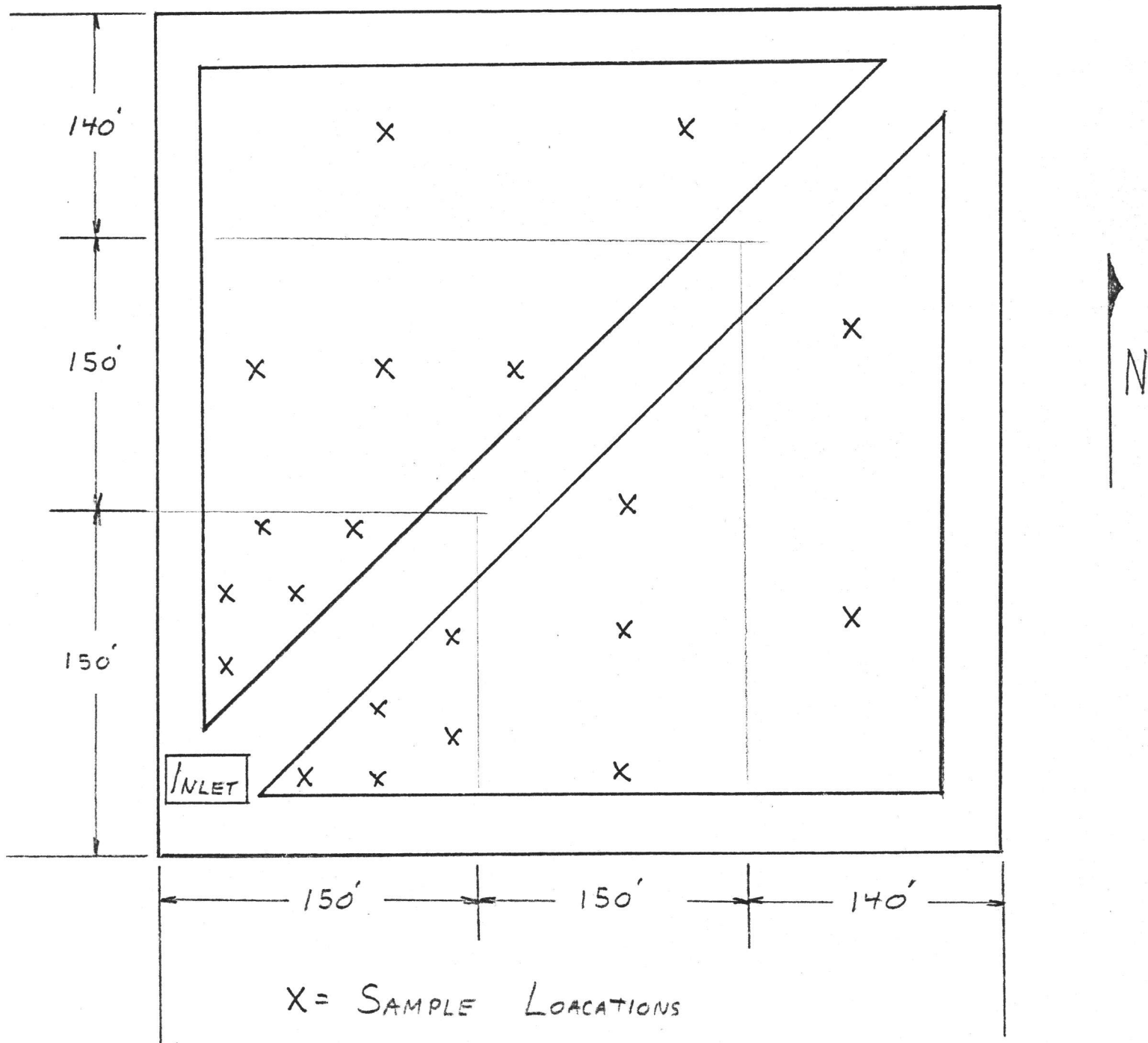


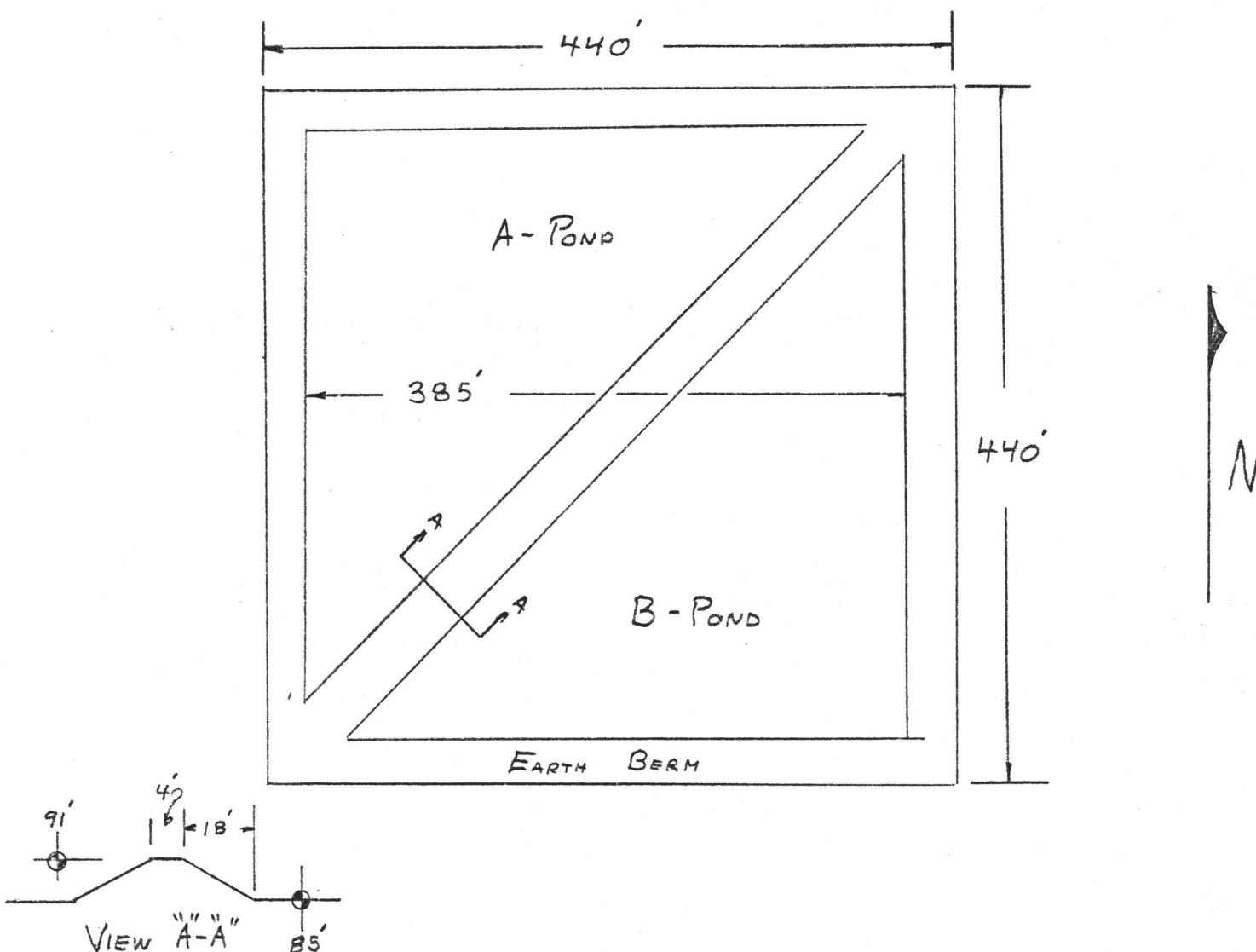


ADVANCED CIRCUITRY

P. O. Box 2847, Commercial Station, Springfield, Mo. 65803 417 862-0751

# SAMPLING PLAN





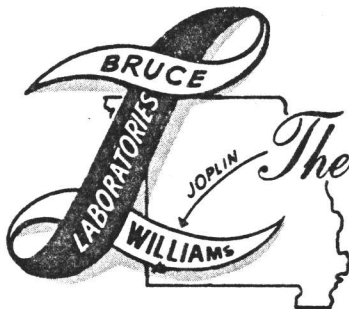
### VOLUME CALCULATION

- ASSUME ① "A" lagoon & "B" lagoon equal size  
 ② Depth of sludge averages 4"

$$\begin{aligned}
 V &= 2 \left[ \frac{1}{2} b h \right] \left[ \frac{4}{12} \right] \\
 &= 2 \left[ \left( \frac{1}{2} \right) \left( 385' - \left( 18' + \frac{4}{2} \right) \right) \left( 385' - \left( 18' + \frac{4}{2} \right) \right) \right] \left[ \frac{4}{12} \right] \\
 &= 44,408 \text{ ft}^3 \rightarrow \approx 1600 \text{ yd}^3
 \end{aligned}$$

Allow 10% error

$$\begin{aligned}
 V &\leq 1800 \text{ yd}^3 \text{ max} \\
 &1400 \text{ yd}^3 \text{ min.}
 \end{aligned}$$



# The Bruce Williams Laboratories

MAIN OFFICE AND LABORATORIES BOX 169 TELEPHONE 623-1556

June 3, 1982

ENGINEERING  
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ANALYSES  
SAMPLING  
CONSULTING  
RESEARCH

ESTABLISHED 1898

*Joplin, Missouri*

62801

Litton Industries - Advanced Circuitry Division  
4811 West Kearney  
Springfield, Missouri 65803

969348 Sample of Sludge from A & B Pond

Tested per Missouri DNR - 10 CSR 25-4.010 Hazardous  
Waste Identification:

	<u>Results</u>	<u>Specifications</u>
Ignitable Hazardous Waste:		
Flash Point, ASTM D-93	80°C+	60°C
Spontaneous/Friction, Etc.	No	
Ignitable Gas	No	
Oxidizer	No	
Corrosive Hazardous Waste:		
pH	8.6	3 - 12
Corrode Steel	No	
Reactive Hazardous Waste:		
Is normally unstable and readily under- goes violent chemical change but does not detonate; reacts violently with water, forms potential explosive mixtures with water, or generates toxic fumes when mix- ed with water; or is a cyanide or sulph- ide-bearing waste which might degenerate toxic fumes under mildly acidic or basic conditions	No	
Is capable of detonation or explosive re- action but requires a strong initiating source or which must be heated under con- finement before initiation can take place, or which reacts explosively with water	No	

969348 Sample of Sludge from A &amp; B Pond

	<u>Results</u>	<u>Specifications</u>
Reactive Hazardous Waste: (Continued)		
Is readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures	No	
Is a forbidden explosive (e.g. such wastes include pyrophoric substances, explosives, Autopolymerizable material and oxidizing agents)	No	
		<u>Extract Level</u> <u>mg/l</u>
Toxic Hazardous Waste:		
Arsenic	<0.01	0.5
Barium	1.00	10.0
Cadmium	<0.01	0.1
Lead	1.70	0.5
Mercury	<0.001	0.02
Selenium	<0.01	0.1
Silver	<0.05	0.5
Cyanide	<0.05	
Sulfides	<0.001	
Copper	14.20	
Nickle	26.00	
Zinc	2.50	
Chromium	4.20	

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES.

THE BRUCE WILLIAMS LABORATORIES

C/4-4301



# General Testing Laboratories, Inc.

Engineering — Chemical Consultants

1517 WALNUT STREET / KANSAS CITY, MISSOURI 64108 / 816-471-1205



Date June 14 198 2

Number 42651

Sample of Sludge

Marked Received in lab 5-17-82

P. O. # 71794

Client Litton Industries, Inc.

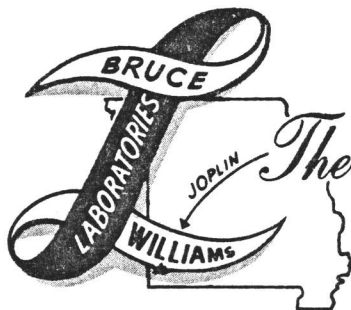
EP Toxicity (Leachate), Federal Register/Vol. 45, No. 98/  
Monday, May 19, 1980, Vol. 45, No. 212/Thursday, October 30,  
1980; Vol. 46, No. 129/Tuesday, July 7, 1981

Arsenic	18 micrograms/liter
Barium	Less than 0.05 mg./liter
Cadmium	Less than 0.01 mg./liter
Chromium (Total)	0.65 mg./liter
Chromium (VI)	Less than 0.01 mg./liter
Lead	0.23 mg./liter
Mercury	Less than 0.2 micrograms/liter
Selenium	20 micrograms/liter
Silver	Less than 0.01 mg./liter
Copper	13 mg./liter
Nickel	14 mg./liter
Zinc	0.57 mg./liter
Total As Received:	
Cyanides	2.89 %
Sulfides	Less than 1.0 mg./liter

GENERAL TESTING LABORATORIES, INC.

By Lawrence Poindexter

(1)c1



# The Bruce Williams Laboratories

MAIN OFFICE AND LABORATORIES Box 169 TELEPHONE 623-1556

April 30, 1982

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RESEARCH

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*Joplin, Missouri*

64802

Litton Industries  
Advanced Circuitry Division  
4811 West Kearney  
Springfield, Missouri 65803

P. O. #71623, 4-22-82  
Acct. #62841

969172 Sample of Sludge - NW

4-22-82

## Analysis on Basis

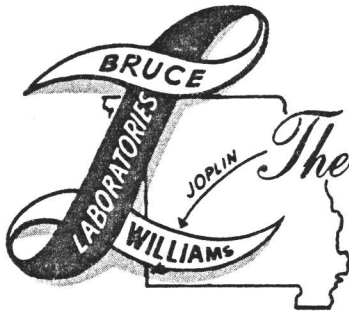
## as Received

## on Leachette

Arsenic	As	<0.001 mg/l	<0.001 mg/l
Lead	Pb	1,219.0 mg/l	1.00 mg/l
Silver	Ag	<0.10 mg/l	<0.10 mg/l
Copper	Cu	36,982.0 mg/l (3.7%)	45.0 mg/l
pH		7.6	5.5
Total Cyanide	Cn	<0.01 mg/l	<0.01 mg/l
Barium	Ba	10.0 mg/l	<0.01 mg/l
Mercury	Hg	<0.001 mg/l	<0.001 mg/l
Chromium - Hexavalent	Cr	2.0 mg/l	<0.01 mg/l
Trivalent	Cr	3,966.0 mg/l	2.60 mg/l
Nickel	Ni	1,869.0 mg/l	2.50 mg/l
% Weight Volatiles @ 100°C.		18.72%	---
@ 600°C.		12.48%	---
Cadmium	Cd	<0.01 mg/l	<0.01 mg/l
Selenium	Se	<0.01 mg/l	<0.01 mg/l
Zinc	Zn	43.0 mg/l	0.10 mg/l

THE BRUCE WILLIAMS LABORATORIES

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES  
C/4-4209



# The Bruce Williams Laboratories

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ESTABLISHED 1898

April 30, 1982

Joplin, Missouri

64802

Litton Industries  
Advanced Circuitry Division  
4811 West Kearney  
Springfield, Missouri 65803

P.O. #71623, 4-22-82  
Acct. #62841

969173 Sample of Sludge - S.W. 4-22-82

## Analysis on Basis

		As Received	On Leachette
Arsenic	As	<0.001 mg/l	<0.001 mg/l
Lead	Pb	2,621.0 mg/l	<0.10 mg/l
Silver	Ag	<0.10 mg/l	<0.10 mg/l
Copper	Cu	2,879.0 mg/l	5.9 mg/l
pH		8.0	5.5
Total Cyanide	Cn	<0.01 mg/l	<0.01 mg/l
Barium	Ba	<0.10 mg/l	<0.10 mg/l
Mercury	Hg	<0.001 mg/l	<0.001 mg/l
Chromium - Hexavalent	Cr	2.0 mg/l	<0.01 mg/l
- Trivalent	Cr	4,503.0 mg/l	<0.01 mg/l
Nickel	Ni	3,470.0 mg/l	9.40 mg/l
% Weight Volatiles @ 100°C		26.18%	
@ 600°C		12.85%	
Cadmium	Cd	<0.01 mg/l	<0.01 mg/l
Selenium	Se	<0.01 mg/l	<0.01 mg/l
Zinc	Zn	36.9 mg/l	0.40 mg/l

THE BRUCE WILLIAMS LABORATORIES

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES  
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